either side, said three salient poles being shifted and arranged around said rotating shaft with non-centrosymmetry a coil being wound on each of said three salient poles;

wherein;

a facing gap between said central salient pole and said field magnet is formed narrower than facing gaps between said auxiliary salient poles and said field magnet;

an exciting force of said central salient pole is greater than that of said auxiliary salient poles; and

in starting, the same magnetic pole as the magnetic pole of said field magnet generates in a facing surface of said central salient pole and a repulsive force occurs so that said armature core is urged to rotate.

2. (Amended) The vibration motor according to Claim 1, wherein said facing surface of said central salient pole which is facing toward said field magnet is formed approximately arc-shaped; and

each facing gap length on either side in a circumferential direction of said central salient pole is different.

3. (Amended) The vibration motor according to Claim 1, wherein width of a central rib of said central salient pole is formed greater than width of ribs of said auxiliary salient poles, said coil of said central salient pole being wound on said central rib.

4. (Amended) The vibration motor according to Claim 1, wherein a number of turns of said coil which is wound on said central salient pole is greater than the number of turns of each said coil wound on respective ones of said auxiliary salient poles to increase an exciting force.

5. (Amended) The vibration motor according to Claim 1, wherein a locus circle which is defined by facing surfaces between said field magnet and said three salient poles is formed in an approximately oval; and

a center of said field magnet and a center of said locus circle approximately correspond with said rotating shaft.

6. (Amended) The vibration motor according to Claim 1, wherein a locus circle which is defined by facing surfaces between said field magnet and said three salient poles is formed having a radius smaller than an inside radius of said field magnet,

a center of said field magnet almost corresponds with said rotating shaft; and

a center of the locus circle shifts toward said central salient pole from said rotating shaft.

Please add Claims 7-14 as follows.

7. (New) A vibration motor comprising:

a field magnet having magnetic poles such that S and N magnetic poles are alternately magnetized in a circumferential direction;

a rotating shaft;

an armature core received in said field magnet and secured to said rotating shaft, said armature core having a central salient pole and a pair of auxiliary salient poles which are spaced apart equidistantly from said central salient pole, each said salient pole including a coil wound thereabout, each said pole having an outward end defined by a facing surface, a facing gap between the facing surface of said central salient pole and said field magnet being less than facing gaps between the facing surfaces at the ends of each of said auxiliary poles and said field magnet;

a commutator in said armature core and located around said rotating shaft, said commutator including segments; and

brushes for slideable electrical contact with said segments of said commutator.

8. (New) The vibration motor according to Claim 7, wherein mass of said armature core is unbalanced with respect to the center of said rotating shaft to increase vibration as said armature core rotates.

9. (New) The vibration motor according to Claim 7, wherein in starting, magnetic flux density for said central salient pole is greater than that of each of said auxiliary salient poles and the magnetic pole of the central salient pole is the same as the adjacent magnetic pole of said field magnet to provide a repulsive force urging said armature core to rotate, and the polarity of said salient poles is switched to continue rotation of said armature core.

10. (New) The vibration motor according to Claim 7, wherein the facing surfaces at ends of said salient poles have an arc shape defined as an oval.

11. (New) The vibration motor according to Claim 10, wherein gap lengths between said central salient pole and said field magnet differ at spaced locations on the facing surface of said central salient pole.

12. (New) The vibration motor according to Claim 7, wherein each said salient pole includes an indentation at a central location at the facing surface thereof.

13. (New) The vibration motor according to Claim 7, wherein each said salient pole includes a rib extending from a

center of said armature core to the respective end defining a facing surface, said rib of said central salient pole having a greater width than a width of the ribs of said auxiliary salient poles.

14. (New) The vibration motor according to Claim 13, wherein said coil wound about said central salient pole includes more turns than each said respective coil wound about a respective one of said auxiliary salient poles.

REMARKS

Reconsideration of the issues raised in the above referenced Office Action is respectfully solicited.

In the drawings Figure 6 has been labeled --PRIOR ART--as requested. Further, in the drawings distance G6 is now labeled in Figure 3 and Figure 4 is relabeled as Figures 4(A)-4(D), respectively. Approval of the proposed drawing corrections is respectfully requested.

The rejection of Claim 6 under 35 USC §112, second paragraph, has been considered. Amended Claim 6 now recites the locus circle having "a radius smaller than an inside radius of said field magnet". Thus, the claimed radius for each of the locus circle and the field magnet are compared. Therefore, Claim 6 clearly defines the invention and withdrawal of the rejection is respectfully requested.

The rejection of Claims 1-6 under 35 USC §103 as being unpatentable over Ackermann (U.S. Patent No. 5 099 165) in view of Sunaga (U.S. Patent No. 5 327 035) and further in view of Barnes (U.S. Patent No. 3 064 150) has been considered.

Ackermann discloses a brushless DC motor having a ratio between the number of permanent magnetic pole pairs and the number of salient poles that is greater than unity but less than 2:1. Column 1, lines 4-26 of Ackermann discloses that a problem with brushless DC motors is that they exhibit detent torque, which leads to undesirable mechanical vibrations, noises and speed fluctuations. As set forth at Column 1, lines 51-52, the object of the invention of Ackermann is to

reduce the detent torque of brushless DC motors. Reducing the detent torque then reduces mechanical vibrations.

Sunaga discloses a vibrator motor for a wireless silent alerting device. The vibrator motor has an armature rotor whose center of mass is off the axis of the shaft thereof. At least one winding arm is angularly out of alignment with the dimensional center of the arcuate blade of the corresponding pole.

Barnes discloses, at Column 1, lines 12-19, an electric motor which is particularly suitable for driving a turn table of a battery operated gramophone record playing apparatus. At Column 1, lines 34-41, Barnes is concerned with minimizing fluctuations in the cogging torque.

Column 1, line 68 through Column 2, line 29 of Barnes further discloses having the air gap between poles of the armature and stator a maximum at the centers thereof to drive the armature more uniformly than would be the case if the radial extent of the air gap were constant. The overall purpose is to provide a uniform torque so that the armature rotates at a more constant speed. Barnes teaches away from having a vibration output by the motor and instead maintains a constant speed.

The Office Action indicates that Ackermann, Sunaga and Barnes are all from the same field of endeavor. This statement is respectfully traversed. Ackermann is drawn to a brushless DC motor designed to minimize mechanical vibrations, noise and speed fluctuations. Likewise, Barnes is drawn to an electric motor intended to rotate at a constant speed for a gramophone apparatus which requires as small an amount of vibration as possible. Sunaga discloses a vibrator motor having a similar function to Applicant's claimed invention.

There is no motivation, absent Applicant's specification, to alter the DC motor of Ackermann intended to reduce or avoid noise and/or vibration with the vibrator motor of Sunaga which purposely is driven to provide vibration. Such combination would destroy the function and purpose of Ackermann.

Further, Claim 1 recites "a facing gap between said central salient pole and said field magnet is formed narrower than facing gaps between said auxiliary salient poles and said field magnet". Even if Barnes were combined with Ackermann, which Applicant disagrees with, the above claimed feature would not result. Barnes discloses having a pair of auxiliary salient poles 16, 17 having a narrower facing gap than the facing gap between the central salient pole 15 and the magnet 3. Thus, even if combined, Ackermann, Sunaga and Barnes do not disclose having the central salient pole with a narrower gap than the auxiliary salient poles.

Further, Barnes discloses a permanent magnet 3 having a pair of poles N, S. The ratio between the salient poles and permanent poles of Barnes differs entirely from the critical ratios disclosed by Ackermann. Thus there is no motivation, absent Applicant's specification, to look to Barnes to modify the brushless DC motor of Ackermann.

The Office Action indicates that Ackermann discloses a vibrating motor. As discussed above, Ackermann discloses a brushless DC motor designed to avoid mechanical vibrations, noise and speed fluctuations.

Claim 1 further recites that "an exciting force of said central salient pole is greater than that of said auxiliary salient poles". The Office Action indicates that changing the facing gaps between the auxiliary salient poles and the field magnet would produce an exciting force for the central salient pole that is greater than the other exciting forces. However, it is unclear as discussed above, what teaching would lead to such a modification. The modification would increase the vibration of the motor of Ackermann, which is against the entire teaching thereof.

Claim 2 recites that "each facing gap length on either side in a circumferential direction of said central salient pole is different". This arrangement is illustrated by gaps G4, G5 in Applicant's Figure 3. The rejection relies on Barnes for this feature. However, as discussed above, there

is no motivation to modify Ackermann in view of the disclosure in Barnes.

Applicant's Claim 3 recites that the width of a central rib of said central salient pole is formed greater than the width of ribs of said auxiliary salient poles. The Office Action relies on Figure 2 of Sunaga to disclose such a rib arrangement. Providing different widths to the ribs of Ackermann would lead to vibration and thus would destroy the intended function thereof. Therefore, there is no motivation for such a modification.

The Office Action relies on Barnes for the features of Applicant's Claims 5 and 6. As discussed above, there is no motivation to combine features of Barnes with the brushless DC motor of Ackermann, much less any of the features recited in Applicant's Claims 5 and 6.

For the above reasons, reconsideration and allowance of Claims 1-6 is respectfully requested.

Added Claims 7-14 further distinguish the applied prior art. Independent Claim 7 recites a vibration motor including "a facing gap between the facing surface of said central salient pole and said field magnet being less than facing gaps between the facing surfaces at the ends of each of said auxiliary poles and said field magnet". This arrangement is not disclosed or suggested by Ackermann, Sunaga or Barnes.

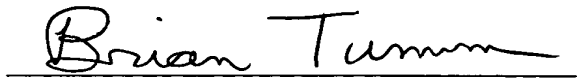
Dependent Claims 8-14 include other features that distinguish the applied prior art. For example, Claim 12 recites that "each said salient pole includes an indentation at a central location at the facing surface thereof". Ackermann does not disclose such an indentation.

For the above reasons, allowance of Claims 7-14 is respectfully requested.

Pursuant to 37 CFR §1.121, attached hereto are separate marked-up versions of the changes made to Claims 1-6 by the current amendment.

Further and favorable reconsideration is respectfully solicited.

Respectfully submitted,



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Encl: Marked-up Claims 1-6
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